RESULTS FROM UPPER MISSISSIPPI RIVER WATER QUALITY ASSESSMENT

David Stoltenberg[1] , John Sullivan[2] , Simon Manoyan, Janice Huang, Walter Redmon, and Richard Zdanowicz

[1] U. S. Environmental Protection Agency, Water Division, 77 W. Jackson Blvd., Chicago, IL 60604

[2] Wisconsin Dept. of Natural Resources, 3550 Mormon Coulee Rd., La Crosse, WI 54601

Biographical Sketch of Authors

David Stoltenberg is a Registered Environmental Engineer with the Region 5 Office of the U.S. Environmental Protection Agency, serving as Regional Water Monitoring Coordinator. John Sullivan is a Mississippi River Water Quality Specialist with the Wisconsin Dept. of Natural Resources. Both senior authors have over 30 yrs. experience in water quality-related fields. The remaining authors are employed by the U.S. Environmental Protection Agency, Chicago, IL.

Abstract

A study was undertaken under the auspices of the Upper Mississippi River Conservation Committee (UMRCC), to determine what water quality data are available for the Upper Mississippi River (UMR) mainstem; to analyze and summarize those data for specific time periods; and to provide those data to decision-makers for evaluation and management of the river in the future. The length of river considered for UMR was 872 mi. long, extending from Anoka, MN (above Minneapolis) to Cairo, IL (confluence with Ohio R.). For purposes of analysis, the river was divided into modified USGS Hydrologic Unit Code (HUC) segments; only summer months were considered; and the total time period of data used was 1980-99, although some stations had older data. Agencies collaborating and providing water quality data included: U.S. Geological Survey (USGS), U.S. Army Corps of Engineers, Wisconsin Dept. Natural Resources (WDNR), Illinois Environmental Protection Agency (IEPA), Minnesota Pollution Control Agency, and Metropolitan Council Environmental Services (Minneapolis area). Entities collaborating and providing fish tissue contaminant data were: Iowa Dept. Natural Resources, IEPA, WDNR, Minnesota Dept. of Health, Missouri Dept. Natural Resources, U.S. Fish & Wildlife Service, and Alcoa, Inc. Water quality and physical variables selected for analysis included: river flow, temperature, dissolved oxygen, specific conductivity, total nitrogen (N), ammonia-N (ionized and un-ionized), nitrite and nitrate-N, total phosphorus, total suspended solids, pH, and chlorophyll a . All of the water quality data were compiled into a spreadsheet in a standard format; the data were queried for summer months only (June 1 - Sept. 15); and the data were grouped by hydrologic segments (HUC) and four 5-year time periods (1980-99). Individual data were plotted by station longitudinally; and standard software was used to generate summary statistics and longitudinal boxplots. Fish tissue contaminant data (PCBs, mercury, chlordane) were also compiled into a spreadsheet, and median tissue concentrations were derived for specific navigational pools and time periods. These data were plotted longitudinally to aid in spatial and temporal evaluations. A final report has been completed, which includes GIS-generated maps showing HUC river segments, station locations, and approximate data density (including data gaps). All of the draft information (text, tables, figures, spreadsheets, and appendices) has been placed on a CD for purposes of sharing with interested agencies/ groups. The recommendations include: 1) this assessment should be updated at 5-year intervals; 2) monitoring agencies should coordinate efforts to improve monitoring coverage; 3) statistical trend analyses should be conducted at locations where more than 20 years of data are available; and 4) UMR agencies should coordinate consistent sampling of fish contaminants at 5-year intervals.